

Relación nº 1 - Disoluciones

(21) Datos: HF_{ac} ; 49% ; $d = 1.17 \text{ g/mL}$

a) Sol: 28.65 M.

b)

0.5 L
28.65 M

 $+$

1 L
28.65 M

 \Rightarrow

1.5 L
M ?

 $M = \frac{14.325 + \cancel{2}}{1.5} = 10.88 \text{ M}$

moles soluto: $0.5 \cdot 28.65 = 14.325 \text{ moles}$ moles soluto: ~~2~~

(22) $\text{CH}_3\text{-COOH} \Rightarrow P_m = 60 \text{ g/mol}$

2 M
1.033 g/mL

Interpretamos el dato de concentración:

2 M \leftarrow 2 moles

1 L de Disolución $\Rightarrow m_0 = 1000 \cdot 1.033 \text{ g/mL}$
 $\hookrightarrow m_0 = 1033 \text{ g}$; $m_d = 1033 - 2 \cdot 60 = 910 \text{ g disol.}$

$M = \frac{2 \text{ moles}}{0.91} = 2.2 \text{ mol/L}$

$X_s = \frac{2}{2 + \frac{910}{18}} = 0.038$; $X_d = 0.962$

$\% = \frac{2 \times 60 \text{ g soluto}}{1030} \times 100 = 11.65\%$

(23) a) Sol: 5.56 M

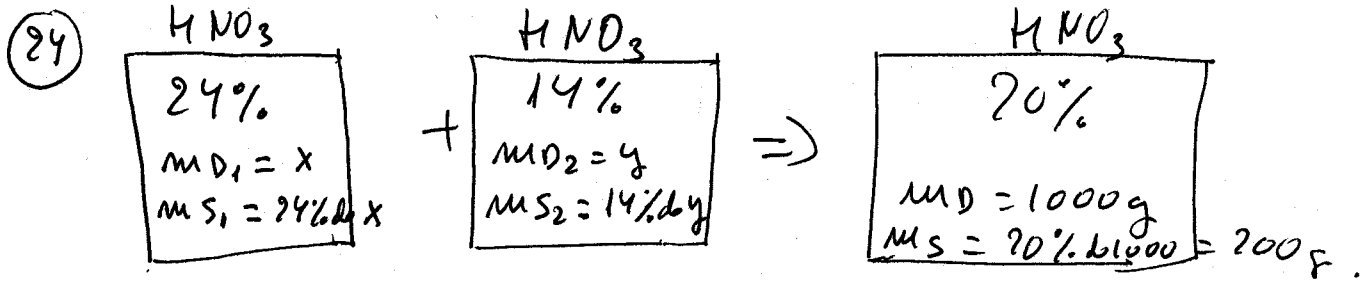
b)

25%
1.40 g/cc

$\text{HNO}_3 \xrightarrow{V_0} 5 \text{ L}$
 0.01 M

moles de soluto necesarios para preparar esta disolución:
 $= 0.01 \times 5 = 0.05 \text{ moles que}$

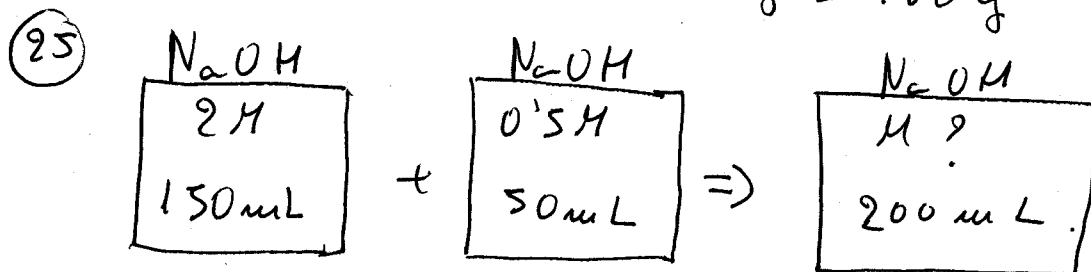
tomamos de la disolución concentrada cuya concentración es 5.56 M $\Rightarrow 5.56 = \frac{0.05}{V_0}$; $V_0 = 9 \text{ mL}$



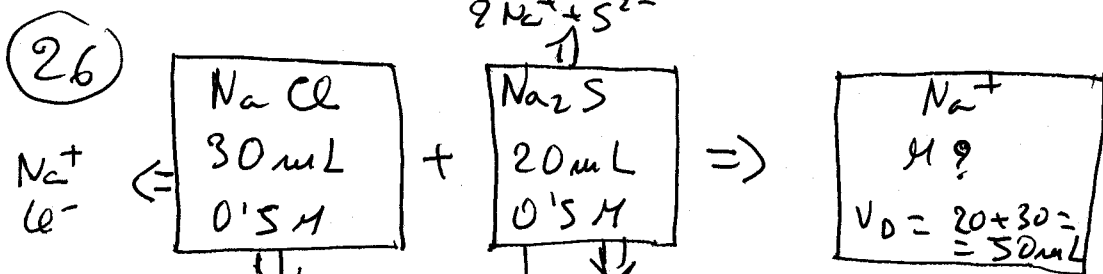
$$\left. \begin{aligned} x + y &= 1000 \text{ g} \\ 0.24 \cdot x + 0.14 \cdot y &= 200 \end{aligned} \right\} \text{Resolver sistema} \Rightarrow$$

$$x = 600 \text{ g}$$

$$y = 400 \text{ g}$$

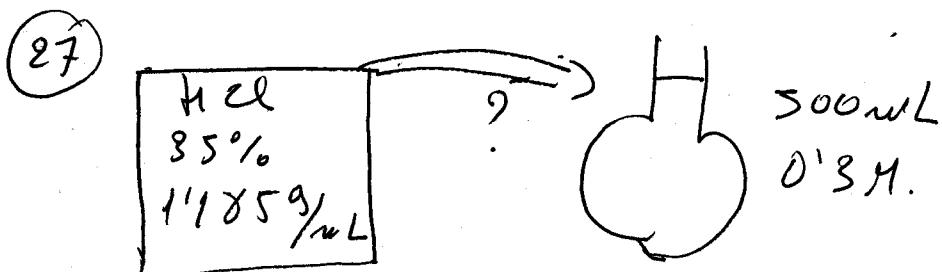


$$M = \frac{2 \cdot 0.15 + 0.5 \cdot 0.05}{0.200} = 1.625 \text{ mol/L} ; N = M \cdot v_D \Rightarrow N = 1.625$$



$$\begin{aligned} n^\circ \text{ mols } \text{NaCl} &= 0.5 \cdot 0.03 = 0.015 \Rightarrow n^\circ \text{ mols } \text{Na}^+ = 0.015 \\ n^\circ \text{ mols } \text{Na}_2\text{S} &= 0.5 \cdot 0.02 = 0.010 \\ n^\circ \text{ mols } \text{Na}^+ &= 2 \cdot 0.010 = 0.020 ; \text{Na}_2\text{S} \rightarrow 2\text{Na}^+ + \text{S}^{2-} \end{aligned}$$

$$\Rightarrow M = \frac{0.020 + 0.015}{0.05} = 0.7 \text{ M}$$



Soluto necesario = $0.3 \cdot 0.3 = 0.09 \text{ mols}$.

$$m_S = 0.09 \cdot 36.5 = 3.285 \text{ g}$$

Para disponer de 3.285 g de HCl puro debemos tomar una m_D concentrada = $\frac{3.285}{0.35} = 9.39 \text{ g}$ de D. \Rightarrow re
corresponde con $v_D = 7.9 \text{ cc}$

(28) Sol: Se toman 20 mL de la disolución 0'5 M.
con la pipeta, se ponen en una matraz aforado de 100 mL
y añadimos agua hasta llegar a 100 mL.

(29)

0'932 M
1 L
$m_s = 0'931 \cdot 1 = 0'931$

+

$V_D = X \text{ mL}$
32'14%
1'16 g/cc

\Rightarrow

1 M
$V_D = 1 \text{ L} + \frac{X}{1000} = 1 + 0'001 X$

$m_D = X \cdot 1'16 \text{ g}$
 $m_s = X \cdot 1'16 \cdot 0'3214 = 0'374 \text{ g}$
 $m' \text{ mols soluto} = \frac{0'37}{36'5} \cdot X = 0'010 X$

$1 M = \frac{0'932 + 0'010 X}{1 + 0'001 X}$; Resolviendo ecuación $\Rightarrow X = 7'37 \text{ cc}$.

(30) Sol: 0'18 M ; 0'18 N.

(31)

1 L
HNO ₃
62'7%
1'38 g/mL

+

1 L
HNO ₃
22'38%
1'13 g/mL

\Rightarrow

1 L
% ?
$d = 1'276 \text{ g/cc}$

a)

$m_{D1} = 1380 \text{ g}$
 $m_{s1} = 865'3 \text{ g}$

$m_{D2} = 1130 \text{ g}$
 $m_{s2} = 252'9 \text{ g}$

$\% = \frac{252'9 + 865'3}{1130 + 1380} = 44'5\%$

b)

$V = \frac{m_D}{1'276} \Rightarrow V_D = \frac{2510}{1'276} = 1'967 \text{ L}$

c)

$M = 9'02 \text{ mol/L}$